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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,663	10/16/2003	Norman Shendon	770C6-099006	1195

7590 06/03/2004

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EXAMINER

NGUYEN, GEORGE BINH MINH

ART UNIT	PAPER NUMBER
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3723

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/688,663

Applicant(s)

SHENDON ET AL.

Examiner

George Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>101603</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Receipt is acknowledged of the IDS filed on October 16, 2003 which has been considered and placed of record in the file.

Claims 1-20 are presented for examination.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

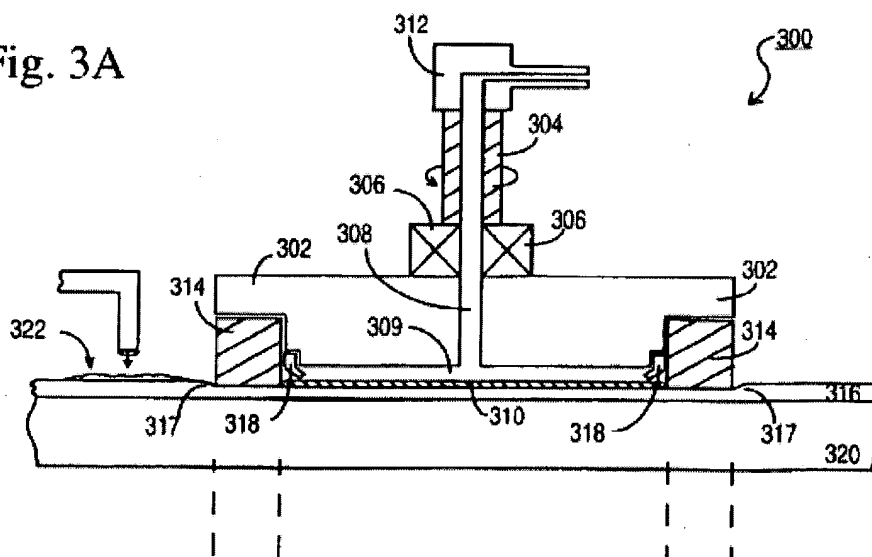
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 4-9, 14-15, and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Breivogel et al.'5,635,083.

With reference to Fig. 3A, col. 4, line 25 to col. 5, line 25, Breivogel discloses the claimed invention.

Fig. 3A



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- 5 The present invention describes novel chemical-mechanical polishing techniques which can be used to generate a uniform polishing pressure across the surface of a wafer being polished. FIG. 3a represents a cross-sectional illustration of an improved wafer or substrate carrier 300 which can be used in the chemical-mechanical polishing process of the present invention. Wafer carrier 300 has a circular stainless steel base 302 attached to a steel rotatable drive shaft 304 by a flexible coupling 306, such as a gimble, to correct for angular misalignments. Drive shaft 304 is hollow to allow pneumatic pressure to be conveyed through passage 308 into chamber 309 created above the backside of wafer 310 and below base 302. A rotating union 312 couples shaft 304 to an air pressure supply (not shown) such as a compressor. Rotary union 312 allows air pressure to be injected through shaft 304 and base 302 as they rotate during polishing. A wear-resistant retaining ring 314 of, for example, ceramic, plastic, or composite materials, is attached to the outer diameter of the bottom of base 302. Wear ring 314 surrounds and is in contact with the outside edge of wafer 310. Wear ring 314 prevents wafer 310 from slipping laterally from carrier 300. Wear ring 314 rides in direct contact with the upper surface of polishing pad 316 and provides vertical loading on polishing pad 316. A resilient lip seal 318 is attached just inside wear ring 314 and covers approximately the outer 10 mm diameter of wafer 310. Lip seal 318 is flexible in order to allow vertical movement of wafer 310. Lip seal 318 creates a leak-tight seal against the backside of wafer 310, the side of carrier base 302, and the inside of wear ring 314. In this way, pneumatic pressure can be maintained in chamber 309 directly against the backside of wafer 310 and maintain a uniform downward force. A characteristic of lip seal 318 is that increasing air pressure causes lip seal 318 to form an even stronger seal.
- 7 In a chemical-mechanical polishing process of the present invention utilizing wafer carrier 300, wafer 310 is placed face down on the upper surface of polishing pad 316 which is fixedly attached to the upper surface of table 320. In this manner the thin film to be polished on wafer 310 is placed in direct contact with polishing pad 316. Pneumatic pressure is injected through rotary union 312, rotary drive shaft 304, and passage 308 into and maintained in chamber 309 against

Please note that the limitation of "housing" is broadly claimed that it could read on a housing supported the polishing pad. Thus, the backing member 302 is movable relative to such housing. Regarding to claims 5-6, the recess is the area created by the lip seal in combination with front surface of the backing area.

Claim Rejections - 35 USC § 103

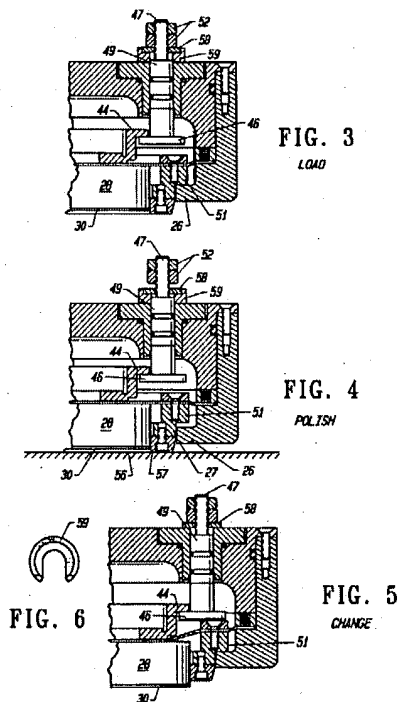
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Breivogel et al.'083 in view of Shendon et al.'5,205,082.

Breivogel has been discussed above, but does not disclose a retainer ring independently movable relative to the backing member.

With reference to Figs. 3-5, col. 5, line 46 to col. 6, line 10, Shendon discloses a wafer polishing head that enables a wafer retainer to float during polishing and yet independently extends beyond the backing member 28 to control the movement of wafer during polishing or changing the wafer.



Please note that Shendon teaches a 1st chamber 23 between housing 12 and backing member 28. The 2nd chamber is the volume underneath membrane 29,

5. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the polishing apparatus of Breivogel with a retainer ring and 1st chamber and 2nd chamber as taught by Shendon to control the movement of the wafer.

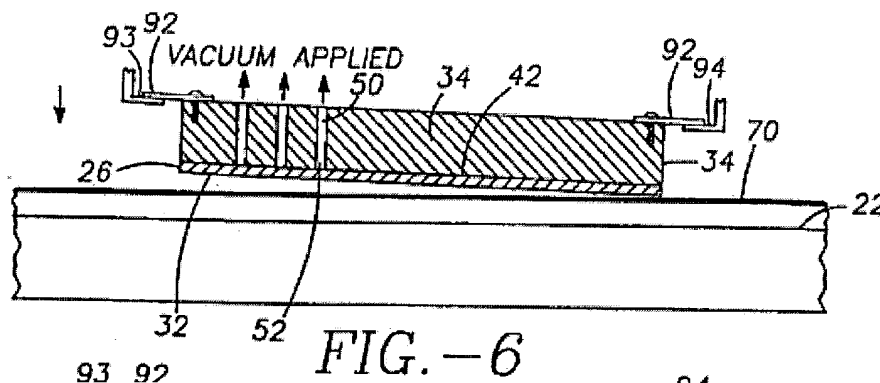
6. Regarding to claim 9, It would have been an obvious matter of design choice to have utilized O ring since applicant has not disclosed that O ring solves any state problem or is for any particular purpose and it appears that the invention would perform equally well with a lip seal or O ring.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Breivogel et al.'083 in view of Volodarsky et al.'209.

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Breivogel has been discussed above, but does not disclose a vacuum to the opening to chuck a substrate to the backing member.

With reference to Fig. 6, Volodarsky discloses wafer header adapted with a vacuum source for easy removal of wafers.



Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the polishing head of Breivogel with a vacuum source as taught by Volodarsky to facilitate easy removal of wafers.

Conclusion

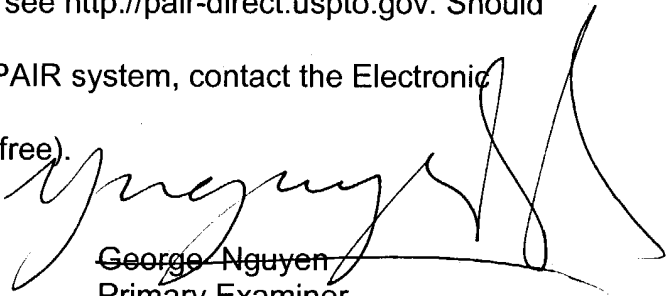
Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Nguyen whose telephone number is 703-308-0163. The examiner can normally be reached on Monday-Friday/630AM-300PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Hail can be reached on 703-308-2687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GEORGE NGUYEN
PRIMARY EXAMINER



George Nguyen
Primary Examiner
Art Unit 3723

GN – May 28, 2004